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2,597,410

DISPENSING CAP FOR CONTAINERS

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FIG. 1

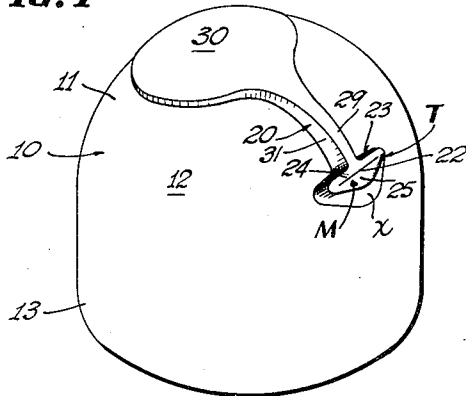


FIG. 2

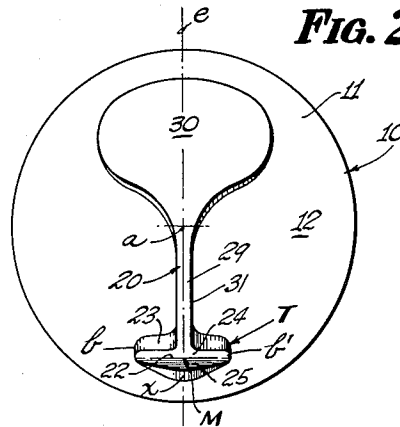


FIG. 3

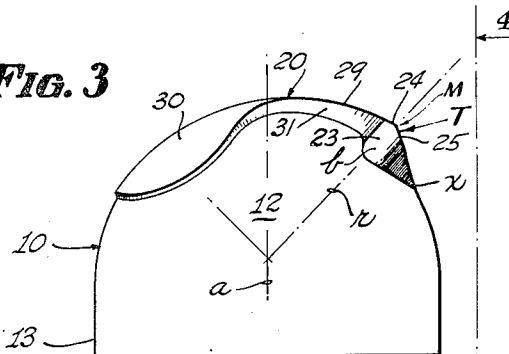


FIG. 4

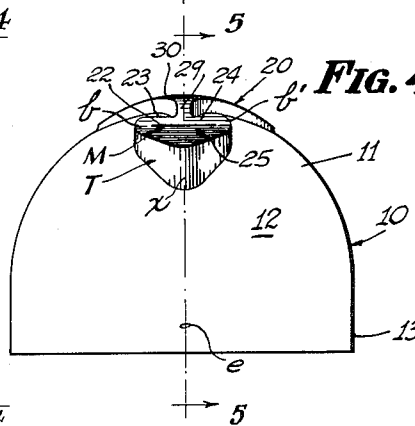


FIG. 5

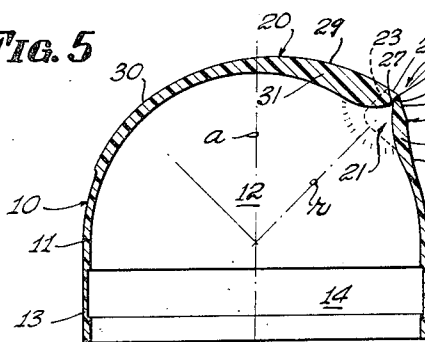


FIG. 6

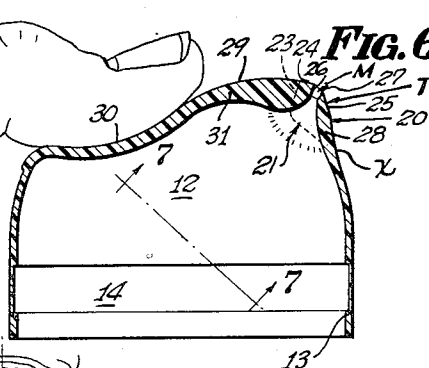


FIG. 7

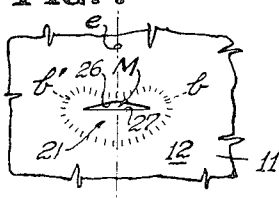
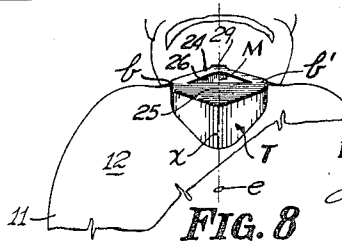


FIG. 8



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DISPENSING CAP FOR CONTAINERS

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8 Claims. (Cl. 222-490)

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This invention relates to pliable caps for containers and more particularly to certain novel improvements in a cap of the type adapted to be pressed for dispensing fluid substance from the container to which it is attached.

Numerous forms of caps have been devised for effecting flow and stoppage of flow of fluids, pastes and the like from a container by finger pressure upon such caps. In most cases the inherent resiliency of the material from which the cap is made plays a part of the principle upon which they operate. The same is true of the present invention except that the contour of the cap and the appendages thereof are so constituted that a more efficient, advantageous and effective application of this principle is attained than was heretofore possible in prior known caps.

One object of the present invention is to provide a pliable slit mouth cap so constructed as to effect a lever action for opening of the slit mouth thereof simultaneously with the cap depressing or fluid displacing action exerted upon the cap.

Another object is to provide, on pliable slit mouth caps, a relatively rigid or stiff lip, forming one margin of the mouth cooperable with a pliable companion lip formed integrally with a treadle pad for effecting opening of the slit mouth simultaneously with depression of the treadle pad.

Another object is to provide the dome-like interior of pliable slit mouthed caps with a funnel-like indentation or configuration rigidified by the stiffened lower lip of the slit mouth for effecting a fulcrum action to the pliable upper lip thereof cooperable with the lever action affected by depression of the treadle pad.

These and other objects and advantages of the present invention will become apparent in the following description and claims when read in the light of the drawings in which:

Fig. 1 is a perspective view of a dispensing cap embodying the attributes of the present invention.

Fig. 2 is a top view of the cap shown in Fig. 1.

Fig. 3 is a side view of the cap shown in Fig. 1.

Fig. 4 is a front view of the cap shown in Fig. 3 and taken from line 4-4 thereof.

Fig. 5 is a section of Fig. 4 taken along line 5-5 thereof.

Fig. 6 is a section similar to that of Fig. 5 with parts thereof shown in a different position.

Fig. 7 is a fragmentary internal elevation of Fig. 6 as seen substantially from line 7-7 thereof.

Fig. 8 is a partial front elevation of the cap when disposed in the position as shown in Fig. 6.

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The improved cap 10 of the present invention, as shown in the drawings, comprises a main body 11 of unitary construction which may be molded from resilient or pliable material such as rubber, synthetic rubber or any one of a number of well known plastic materials having such properties.

The body 11 is preferably of dome shape to provide a substantially hemispherical portion 12 merging with an annular collar portion 13 adapted to fit over the open mouth of a container, not shown. It will be understood that the internal wall of the annular collar 13 can be provided with any well known form of attaching medium such as threading, lugs or grooves, dependent upon the configurations on the neck of the container to which the cap 10 is to be attached. In the present disclosure a simple form of annular groove 14 is shown formed on the internal wall of the annular collar 13. Since the material from which the cap 10 is made is resilient it will be apparent that the collar 13 can be stretched to fit over the neck of a container in a well known manner.

The present invention contemplates the provision of certain embellishments 20 on the exterior surface of the hemispherical portion or dome 12 in conjunction with an indentation 21 formed in the internal surface of the dome 12. The embellishments 20 are in a common equatorial plane *e*, Figs. 2 and 4 span a little more than a quadrant of a circle including the dome 12. The embellishment 20 is thickest at one of its extremities T positioned along a radial line *r* also in plane *e* and disposed substantially 45° from an axis line *a* extended domeward from the annular collar 13. This precise position, namely along radial line *r* is also the location of the indentation 21 formed in the internal wall of the dome 12. The indentation 21 is normally funnel shaped as best seen in Fig. 5, the outer surface of the dome 12 being built up in the region of the indentation 21 in a manner now to be explained.

As best visualized in Figs. 2, 4 and 5, the thickest extremity T of the embellishments 20 is slit as at 22 transverse to the plane *e* and perpendicular to radial line *r*, i. e., axially of the funnel shaped indentation 21 to form a mouth M in the cap. Moreover, the extremity T is preferably triangular shape having its bases 23 disposed substantially perpendicular to plane *e* and parallel to the slit 22. The slit 22 is disposed relatively close to the base 23 so as to form a relatively supple yet firm upper lip 24 for the mouth M. The remaining portion of the extremity T confined

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within the apex angle sides of its triangular form constitutes a relatively firm lower lip 25 for the mouth M against which the upper lip 24 firmly presses due to its own resiliency.

In connection with the foregoing it will be noted that the upper and lower lips 24—25 are each provided with complementary flat surfaces 26 and 27, respectively, which, when pressed together, as explained above, form a seal at the apex of the funnel shaped indentation 21 in the cap, see Figs. 5 and 6. In these last mentioned views it will be noted that the apex x of the triangular formed extremity T merges with the outer surface of the dome 12 just outside of the lower extremity of the rim of the funnel shaped indentation 21. Moreover, the wall 28 of the dome 12 is thickened slightly between apex x and the slit 22 but becomes increasingly thicker in the direction of both base angles of the triangular extremity T. This, in effect, provides a pair of trunnion-like and relatively stationary posts b and b' at either ends of the upper and lower lips 24 and 25. Since the upper and lower lips are formed integrally with these posts b and b' the posts serve as an anchorage for the yieldable, resilient upper lip 24.

Referring now to Figs. 1, 2 and 4 it will be noted that the upper lip 24 forms a T-head on a rib 29 which is part of the embellishment 20. This rib 29 is relatively narrow at its point of connection with the upper lip 24 and extends back over the dome 12 beginning, approximately at axis a , to spread to either side of plane e to form a round pad 30. As best seen in Fig. 5, the pad 30 constitutes a relatively thick treadle on the otherwise pliable dome wall, which treadle is operatively connected to the gradually thickening rib 29 so that the latter constitutes a lever 31. The end of the lever 31, between the posts b — b' as hereinbefore explained, is rounded in conformity with the funnel shape of the indentation 21. In this manner, the rib 29 is rather rigidly connected to the supple upper lip 24 so that upon depression of the treadle pad 30 as illustrated in Fig. 6, the rib 29 is pulled backward. Simultaneously therewith the lever 31, being more rigid than the main body of the dome 12, is swung counterclockwise about a fulcrum point or zone affected by the posts b — b' . Thus the upper lip 24 is rocked back at its connection with the rib 29 while the remaining portions of the lip 24, being supple, are stretched from straight to angular disposition with respect to each other as shown in Fig. 8.

During the foregoing depression of the treadle pad 30 the relatively firm lower lip 25 remains stationary and therefore the complementary flat surfaces 26—27 on the lips are separated and the mouth M opened. While the rocking of the lever downward and rearwardly somewhat distorts the normal bell shape of the funnel indentation 21, the triangular orifice formed by the now open mouth is substantially as shown from within the dome in Fig. 7.

In accordance with the foregoing it will be apparent that depression of the treadle pad 30 as shown in Fig. 6, in addition to effecting displacement of space within the otherwise sealed container to which the cap 10 is attached, also effects positive opening of the slit mouth to allow fluid substance to flow through the mouth M. However, when the pressure on the treadle pad 30 is released the dome 12 and lever 31 both flex back to their normal positions. Thus the rigid rib 29 is forced back toward the mouth M as the stretched upper lip 24 springs back into its normal position thereby causing the flat face 26 of the

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upper lip to sealingly engage the flat face 27 of the relatively stationary lower lip 25. In this manner flow of fluid through the mouth M is promptly cut off regardless of the disposition of the cap 10 and the container to which it is secured.

While the foregoing description has been specific as to what I consider the best mode of applying the principle of my invention it will be apparent that the same is susceptible to variations, modifications and alterations without departing from the spirit of my invention. I, therefore, desire to avail myself of all variations, modifications and alterations as fairly come within the purview of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. A dispensing cap of resilient-pliable material comprising a dome-like body having its open end adapted to be secured to the neck of a container, the exterior surface of said body having a raised embellishment extending over the same in a common equatorial plane relative to its dome-like shape and including a triangular shaped mouth having its base extending transversely of said common equatorial plane and slit parallel to said base to provide a supple upper lip for said mouth, and the balance of said embellishment constituting a lever terminating in a treadle pad which when depressed effects a backward pull upon said lip for stretching the same to thereby open said mouth.

2. A dispensing cap of resilient-pliable material comprising a dome-like body having its open end adapted to be secured to the neck of a container, the exterior surface of said body having a raised embellishment extending over the same in a common equatorial plane relative to its dome-like shape and including a triangular shaped mouth having its base extending transversely of said common equatorial plane and slit parallel to said base to provide a supple upper lip for said mouth, the balance of said triangular shaped mouth constituting a relatively stiff lower lip, said triangular shaped mouth providing postlike trunnions adjacent the ends of the slit in said mouth and forming an anchorage for the ends of said upper lip, and the balance of said embellishment constituting a lever terminating in a treadle pad which when depressed effects a backward pull upon said lip for stretching the same to thereby open said mouth.

3. In a flexible dome-like dispensing cap for a container, an integral embellishment on the exterior surface of said cap comprising a thick end portion of triangular shape and a lever-like rib extending from the base side of said thick end portion in a common equatorial plane and gradually reducing in thickness so as to terminate in a treadle pad, said thick end portion being slit in proximity to the base side thereof and transverse to said equatorial plane to form a supple upper lip and a relatively stiff lower lip normally engaging each other, said dome-like cap having a funnel shaped indentation formed on its interior surface in the zone of the slit formed in said thick end portion, the outer base angles of which provide fulcrum-like anchorages at either end of the slit whereby to effect a rocking action to said lever-like rib upon depression of said treadle pad for stretching said upper lip away from said relatively stiff lower lip to open the mouth formed thereby.

4. In a flexible dome-like dispensing cap made of resilient-pliable material, an integral forma-

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tion thereon comprising a rib extending in a common plane over said cap and a triangular shaped head having its base side connected perpendicularly to said rib, said head being slit transversely of said common equatorial plane and in proximity to the base side of said triangular shaped head to provide a mouth therein having a supple upper lip and a relatively firm lower lip, said cap having a funnel shaped indentation in its interior surface in axial alignment with said mouth and beneath said triangular shaped head whereby the angle between the sides and base of said triangular shaped head provide postlike trunnions at either side of said mouth, and a padlike treadle formed integrally with the opposite end of said rib adapted to be depressed to effect a fulcrum action to said rib for stretching the upper lip of said mouth away from the relatively firm lower lip thereof.

5. In a flexible dome-like dispensing cap made of resilient-pliable material, an integral formation thereon comprising a rib extending over said cap in a common equatorial plane and a triangular shaped head having its base side connected perpendicularly to said rib, said head being slit in proximity to the base side thereof to provide a mouth having a supple upper lip and a relatively firm lower lip, said cap having a funnel shaped indentation in its interior surface in axial alignment with said mouth, said triangular head being thickened to accommodate said funnel shaped indentation and to provide postlike trunnions at either side of said mouth, said rib forming a lever reduced in thickness in a direction away from said triangular head and terminating in a treadle pad adapted to be depressed to effect a fulcrum action to said rib between said postlike trunnions for stretching the upper lip of said mouth away from the relatively firm lower lip thereof.

6. In a flexible dome-like dispensing cap made of resilient-pliable material, an integral dispensing mouth portion and lever means for actuating the same comprising a rib extending in a common equatorial plane over said cap and a triangular shaped head having its base side connected perpendicularly to said rib and having a slit formed therethrough transversely of said common equatorial plane in proximity to the base side of said triangular shaped head to provide a supple upper lip and a relatively firm lower lip in said mouth portion of said cap, said triangular shaped head being thickened to accommodate a funnel shaped indentation on the

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inner surface of said dome-like cap and to provide postlike trunnions at either side of the slit formed in said triangular shaped head, said rib terminating in a treadle pad adapted to be depressed to effect a fulcrum action to said rib for stretching the upper lip of said mouth away from the relatively firm lower lip thereof.

7. A dispensing cap of resilient-pliable material comprising a dome shaped body having integral formed embellishments on its exterior surface in a common equatorial plane thereover, said embellishments being thickest at one end thereof and spread into a triangular portion having its base side extending perpendicular to said common equatorial plane, said dome shaped body having a funnel shaped indentation formed on its interior surface in the region of said triangular portion, said triangular portion being slit through to said funnel shaped indentation and in proximity to the base side of said triangular portion for providing a mouth having a supple upper lip and a relatively firm lower lip, and an integral rib connected to said upper lip and terminating at the opposite end of said embellishment in a treadle pad adapted when depressed to pull backwardly said upper lip to stretch the latter away from said relatively firm lower lip.

8. A dispensing cap of resilient-pliable material comprising a dome shaped body having integral formed embellishments on its exterior surface in a common equatorial plane thereover, said embellishments being thickest at one end thereof and spread into a triangular portion having its base side extending perpendicular to said common equatorial plane, said dome shaped body having a funnel shaped indentation formed on its interior surface in the region of said triangular portion, said triangular portion being slit through to said funnel shaped indentation and in proximity to the base side of said triangular portion for providing a mouth having a supple upper lip and a relatively firm lower lip, said triangular portion providing at its base angles a pair of trunnionlike posts adjacent the ends of the slit formed in said triangular portion, and an integral rib connected to said upper lip and terminating at the opposite end of said embellishment in a treadle pad providing a lever fulcrumed between said trunnionlike posts whereby to stretch said upper lip away from said relatively firm lower lip when said treadle pad is depressed.

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No references cited.